

CLAIMS

What is claimed is:

1. A packing element comprising:
 - a plurality of ribs connected to form a first segment and a second segment of a ribbed shell of a revolution of a conic section;
 - a conic section structure connected to a reinforcing plurality of ribs, wherein the conic section structure is connected to the first segment and to the second segment to enable folding to make the packing element; and
 - at least one drip point positioned within the packing element.
2. A packing element as in claim 1, wherein the packing element defines apertures.
3. A packing element as in claim 1, wherein the plurality of ribs comprises a first plurality of longitudinal ribs and at least one first latitudinal rib in the first segment, and wherein each first plurality of longitudinal ribs further comprises correspondingly a first end and a second end.
4. A packing element as in claim 3, wherein the first end of at least one of the plurality of ribs terminates to connect at the at least one first latitudinal rib.
5. A packing element as in claim 1, wherein the plurality of ribs comprises a second plurality of longitudinal ribs and at least one second latitudinal rib in the second segment, and wherein each second plurality of longitudinal ribs further comprises correspondingly a third end and a fourth end.
6. A packing element as in claim 5, wherein the third end of at least one of the plurality of ribs terminates to connect at the at least one second latitudinal rib.
7. A packing element as in claim 1, wherein the plurality of ribs and the reinforcing plurality of ribs have cross section sufficient to withstand external load due to fluids in a particular application.
8. A packing element as in claim 1, wherein the plurality of ribs comprise rods having a circular cross section.
9. A packing element as in claim 1, wherein the plurality of ribs comprise rods having non-circular cross-section.
10. A packing element as in claim 9, wherein the plurality of ribs comprise rods twisted along the length to increase the contact area.

11. A packing element as in claim 1, wherein the plurality of ribs further comprise grooves.
12. A packing element as in claim 1, wherein the reinforcing plurality of ribs further comprise drip points.
13. A packing element as in claim 12, wherein the drip points are integral to the reinforcing plurality of ribs.
14. A packing element as in claim 1, wherein the ribbed shell of the revolution of a conic section is spherical.
15. A packing element as in claim 1, wherein the ribbed shell of the revolution of a conic section is ellipsoidal.
16. A packing element as in claim 1, wherein the drip points emanate inwardly in the packing element.
17. A packing element as in claim 1, wherein the conic section structure is reinforced with diametrically positioned reinforcing plurality of ribs to appear like a spoked wheel structure.
18. A packing element as in claim 1, wherein the conic section structure is reinforced with the reinforcing plurality of ribs positioned nearly parallel to each other.
19. A packing element as in claim 1, wherein the conic section structure is reinforced with the reinforcing plurality of ribs angularly positioned to each other.
20. A packing element as in claim 19, wherein the conic section structure is reinforced with the reinforcing plurality of ribs forming a mesh.
21. A packing element as in claim 1, wherein the conic section structure further comprises drip points.
22. A packing element as in claim 1, wherein the reinforcing plurality of ribs further comprise drip points.
23. A packing element as in claim 1, wherein the first segment and the second segment are coupled to the conic section structure to enable folding to make the packing element.
24. A packing element as in claim 23, wherein the first segment and the second segment, are coupled to the conic section structure by living hinges to enable folding to make the packing element.

25. A packing element as in claim 23, wherein the first segment, the second segment, and the conic section structure are snapped together to make the packing element.
26. A packing element as in claim 24, wherein the first segment comprises a plurality of segments of the first segment.
27. A packing element as in claim 24, wherein the second segment comprises a plurality of segments of the second segment.
28. A packing element as in claim 24, wherein the conic section structure comprises a plurality of segments of the conic section structure.

29. A packing element comprising:
 - a first plurality of external ribs, each rib having a first end, and a second end, said first plurality of external ribs longitudinally spatially positioned and connected together at their first ends and connected together at their second ends to form a first half of a ribbed shell of a revolution of a conic section;
 - a second plurality of external ribs, each rib having a third end and a fourth end, said second plurality of external ribs longitudinally spatially positioned and connected together at their third ends and connected together at their fourth ends to form a second half of a ribbed shell of the revolution of a conic section;
 - a spoked conic section structure comprising a plurality of radial ribs connected to a ring so that the spoked conic section structure fits between the first half and the second half of the ribbed shell to form the packing element; and
 - at least one drip point positioned within the packing element.
30. A packing element as in claim 29, wherein the packing element defines apertures.
31. A packing element as in claim 29, wherein the packing element further comprises at least one first latitudinal rib in the first half.
32. A packing element as in claim 31, wherein the first end of at least one of the first plurality of external ribs terminates to connect at the at least one first latitudinal rib.
33. A packing element as in claim 29, wherein the packing element further comprises at least one second latitudinal rib in the second half.
34. A packing element as in claim 33, wherein the first end of at least one of the first plurality of external ribs terminates to connect at the at least one second latitudinal rib.
35. A packing element as in claim 29, wherein the external ribs and the radial ribs have cross section sufficient to withstand external load due to fluids in a particular application.
36. A packing element as in claim 29, wherein the external ribs comprise rods having a circular cross section.

37. A packing element as in claim 29, wherein the external ribs comprise rods having non-circular cross-section.
38. A packing element as in claim 37, wherein the external ribs comprise rods twisted along the length to increase the contact area.
39. A packing element as in claim 29, wherein the external ribs further comprise grooves.
40. A packing element as in claim 29, wherein the drip points are integral to the radial ribs.
41. A packing element as in claim 29, wherein the ribbed shell of the revolution of a conic section is spherical.
42. A packing element as in claim 29, wherein the ribbed shell of the revolution of a conic section is ellipsoidal.
43. A packing element as in claim 29, wherein the drip points emanate inwardly in the packing element.
44. A packing element as in claim 29, wherein the ring further comprises drip points.
45. A packing element as in claim 29, wherein the radial ribs further comprise drip points.
46. A packing element as in claim 29, wherein the first half and the second half, are coupled to the spoked conic section structure to enable folding to make the packing element.
47. A packing element as in claim 46, wherein the first half and the second half, are coupled to the spoked conic section structure by living hinges to enable folding to make the packing element.
48. A packing element as in claim 46, wherein the first half, the second half, and the spoked conic section structure are snapped together to make the packing element.
49. A packing element as in claim 46, wherein the first half comprises a plurality of segments of the first half.

50. A packing element as in claim 46, wherein the second half comprises a plurality of segments of the second half.
51. A packing element as in claim 46, wherein the spoked conic section structure comprises a plurality of segments of the spoked conic section structure.

52. A system comprising:
 - a column; and
 - at least one packing element packed in the column, wherein the packing element comprises:
 - a plurality of ribs connected to form a first segment and a second segment of a ribbed shell of a revolution of a conic section;
 - a conic section structure connected to a reinforcing plurality of ribs, wherein the conic section structure is connected to the first segment and to the second segment to enable folding to make the packing element; and
 - at least one drip point positioned within the packing element.
53. A system as in claim 52, wherein the packing element defines apertures.
54. A system as in claim 52, wherein the plurality of ribs comprises a first plurality of longitudinal ribs and at least one first latitudinal rib in the first segment, and wherein each first plurality of longitudinal ribs further comprises correspondingly a first end and a second end.
55. A system as in claim 54, wherein the first end of at least one of the plurality of ribs terminates to connect at the at least one first latitudinal rib.
56. A system as in claim 52, wherein the plurality of ribs comprises a second plurality of longitudinal ribs and at least one second latitudinal rib in the second segment, and wherein each second plurality of longitudinal ribs further comprises correspondingly a third end and a fourth end.
57. A system as in claim 56, wherein the third end of at least one of the plurality of ribs terminates to connect at the at least one second latitudinal rib.
58. A system as in claim 52, wherein the ribbed shell of the revolution of a conic section is spherical.
59. A system as in claim 52, wherein the ribbed shell of the revolution of a conic section is ellipsoidal.
60. A system as in claim 52, wherein the drip points emanate inwardly in the packing element.
61. A system as in claim 52, wherein the conic section structure is reinforced with the reinforcing plurality of ribs forming a mesh.

62. A system as in claim 52, wherein the conic section structure further comprises drip points.
63. A system as in claim 52, wherein the reinforcing plurality of ribs further comprise drip points.
64. A system as in claim 52, wherein the first segment and the second segment are coupled to the conic section structure to enable folding to make the packing element.
65. A system as in claim 64, wherein the first segment and the second segment, are coupled to the conic section structure by living hinges to enable folding to make the packing element.
66. A system as in claim 64, wherein the first segment, the second segment, and the conic section structure are snapped together to make the packing element.

67. A method of enhancing fluids reaction, the method comprising:
 - packing a column with at least one packing element, wherein the element comprises:
 - a plurality of ribs connected to form a first segment and a second segment of a ribbed shell of a revolution of a conic section;
 - a conic section structure connected to a reinforcing plurality of ribs, wherein the conic section structure is connected to the first segment and to the second segment to enable folding to make the packing element; and
 - at least one drip point positioned within the packing element; and
 - passing reactant fluids into appropriate entrances of the column.
68. A method as in claim 67, wherein the liquid reactants enter through upper entrances of the column.
69. A method as in claim 67, wherein the gaseous reactants enter through lower entrances of the column.

70. A method of making a packing element, the method comprising:
making a mold, wherein the mold comprises spaces to yield a packing element when filled with material and further wherein the packing element comprises:
a plurality of ribs connected to form a first segment and a second segment of a ribbed shell of a revolution of a conic section;
a conic section structure connected to a reinforcing plurality of ribs, wherein the conic section structure is connected to the first segment and to the second segment to enable folding to make the packing element; and
at least one drip point positioned within the packing element; and
processing the molding material in the mold; and
extracting the packing element from the mold.
71. A method as in claim 70, wherein the material is plastic.
72. A method as in claim 70, wherein the material is metal.
73. A method as in claim 70, wherein the mold comprises a die.
74. A method as in claim 70, wherein the processing comprises molding.
75. A method as in claim 70, wherein the processing comprises sintering.